Software Design Document

Victorian Accident Analysis Project

Harris Huntington, Eric Martin

Table of Contents

[1.0 System Vision 3](#_Toc46748622)

[1.1 Problem Background 3](#_Toc46748623)

[1.2 System Overview 3](#_Toc46748624)

[1.3 Potential Benefits 3](#_Toc46748625)

[2.0 Requirements 4](#_Toc46748626)

[2.1 User Requirements 4](#_Toc46748627)

[2.2 Software Requirements 4](#_Toc46748628)

[2.3 Use Cases 4](#_Toc46748629)

[3.0 System Components and Software Design 5](#_Toc46748630)

[3.1 System Components 5](#_Toc46748631)

[3.2 Software Design 5](#_Toc46748632)

[4.0 User Interface Design 6](#_Toc46748633)

# System Vision

## Problem Background

This Victorian Accident Analysis dataset is a set of data containing road crash statistics from the five years between 2015 and 2020 within the Australian state of Victoria. This team has been tasked to develop a program which will allow users to analyse certain data and trends from the dataset.

## System Overview

This software will allow a user to analyse data from the dataset through a GUI. The user will be prompted to select a time frame (days) and when selected, information about all the accidents within that time frame will be displayed.

The average number of accidents that occur in this time frame can be viewed as a graph. To narrow down accident logs, a text input will allow a user to enter key words such as pedestrian, truck, car etc. Any accidents that contain these keywords will be shown to the user.

An alcohol use analysis feature will allow users to see a visual representation of alcohol impact. This will include accidents with alcohol related causes.

Another feature will be an analysis of the most common average time accidents occur on each day of the week.

## Potential Benefits

This will have several benefits to a few different user groups. Governments will be able to use this data to understand what is causing the most accidents, and work on changes that can help reduce these accidents thus saving damages and lives. As well as insurance companies can use this data to help model their plans and get a better idea of when, where, and why accidents happen and to be able to offer more suitable plans for different groups of people.

This will also provide important information to general road users and allow them to understand how accidents happen on the road and better prepare themselves and change their habits to help reduce the number of accidents they could cause or be a part of.

# Requirements

## User Requirements

The user needs to be able do the following:

* Select use (see accidents, view accident graph, open alcohol use section)
* Input a date timeframe
* Scroll down through multiple accident logs
* Open and close graphs
* Input text
* Bookmark certain accident logs

The users of this software are likely to be the government and insurance companies, who need to use accident data to create policies.

## Software Requirements

The software will require the following:

1. A data set will be stored within the program
2. The program shall accept 2 date inputs
3. If an object in the data set has a date between the two accepted dates, then it will be displayed.
4. The program shall accept up to 2 keywords through a text input.
5. If an object in the dataset contains these key words in its Accident\_Type attribute, then it will be displayed
6. The program shall accept the date and text inputs at the same time when necessary.
7. The program shall modify the graph shown with respect to the documents being displayed at the time.
8. The program will provide trends in regards to alcohol consumption and accidents

In this section you detail what the requirements for the software are. What functionality will it provide? This is usually a formal listing, with requirements often using the word ‘Shall’. IE:

R1.1 The program shall accept multiple file names as arguments from the command line.

R1.2 Each file name can be a simple file name or include the full path of the file with one or more levels.

etc …

Can be primarily functional requirements, though you may include other types if you think of them.

## Use Cases & Use Case Diagrams

In this section you provide some use cases showing how people may use your software.

# Software Design and System Components

## Software Design

A block diagram/flowchart of how your software might work

## System Components

### Functions

Preliminary list of all functions in the software. For each function in the list the following information is provided:

* a brief description of what it does (1 or 2 sentences);
* a list of the input parameters, and their data types, and what they are used for;
* a list of any side effects caused by the function (ie change global or member variables, changes data passed by reference from calling function etc)
* a description of the function’s return value

### Data Structures / Data Sources

List of all data structures in the software (eg linked lists, trees, arrays etc) or eternal data sources. For each data structure in the list the following information is provided:

* Type of structure (tree, list etc),
* Description of where and how it is used
* List of data members, and what each one is for do
* List of functions that use it

### Detailed Design

Pseudocode for all non-standard / non-trivial algorithms that operate on data structures

# User Interface Design

This is your initial interface design. Describe the tools you used for this design stage and any key findings that informed your design. This introduction is descriptive and should explain what you have completed for the actual design work you will present in the sub-sections below.

## Structural Design

Structural design refers to the navigational and information structure of your product – the structure that supports the interface layout. How will you structure your product? How will you group your information? How will you navigate through your product? Why? This can take the form of a diagram showing structure and hierarchy, supported by a discussion and justification of your choices. Why have you made these design choices? Describe and outline the structure of your interface and of your information.

## Visual Design

Detail your visual design: Layout, visual elements, icons, graphics, style, colour, fonts general screen designs. This can be sketches, wireframes, mockups etc, supported by a discussion, explanation, and justification of your choices.

